REMARKS

Claims 1-6 are pending in the application upon entry of the amendments. Claims 2-6 have been amended to better describe certain aspects of the invention. Favorable reconsideration in light of the amendments and the remarks which follow is respectfully requested.

Allowable Subject Matter

The Examiner's indication that claim 6 contains allowable subject matter is noted with appreciation.

Rejection of Claims 2 and 4 Under 35 U.S.C. §112, Second Paragraph

Claims 2 and 4 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Claims 2 and 4 have been amended as suggested by the Examiner. Withdrawal of the rejection is respectfully requested.

Rejection of Claim 1 Under 35 U.S.C. §103(a) over Kawada

Claim 1 stands rejected under 35 U.S.C. §103(a) over Kawada et al (HCAPLUS 1998: 239541 and Japan Patent Application Publication No. 10-101615, hereinafter "Kawada"). The Applicants respectfully request withdrawal of the rejection for at least the following reasons. The cited art does not teach or suggest all the features of the claimed invention.

To facilitate discussion of Kawada, enclosed is full translation thereof.

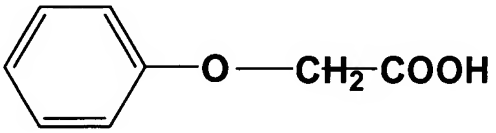
To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the cited art or in the knowledge generally available to one of ordinary skill in the art, to modify or combine cited art teachings. Second, there must be a reasonable

expectation of success. Finally, the cited art must teach or suggest all the claim features. *See* MPEP §706.02(j).

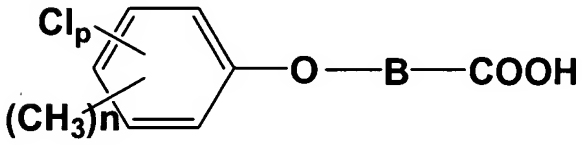
In addition, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the cited art and not based on applicant's disclosure. *See In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Kawada fails to teach or suggest a 2,4,5-trichlorophenoxyalkyl carboxylic acid represented by formula (I), wherein n is an integer of 5 to 10, as required in claim 1. The Examiner contends that the compound of formula II of Kawada (hereinafter "Kawada compound") wherein B = $(CH_2)_3$ is an obvious structural homologue of the corresponding $(CH_2)_{5\text{-}10}$ compounds of formula (I) of claim 1, relying on MPEP 2144.09. The Examiner's contention is based on the assertion that the claimed compounds would be expected to have similar properties to the Kawada compound. Applicants respectfully disagree.

Kawada discloses the Kawada compound as an antigen to obtain an antibody that "specifically" binds phenoxyacetic acids for determining a concentration of the phenoxyacetic acids (see Abstract and paragraph [0008] of the attached full English translation of Kawada). The phenoxyacetic acids and Kawada compound has a following chemical structure, respectively (see paragraph [0003] of the attached English translation of Kawada).



Phenoxyacetic acids



Kawada compound (Formula II)

Kawada also teaches that B of the Kawada compound must be methylene ($-CH_2-$), ethylidene ($CH_3CH=$), or trimethylene ($-CH_2CH_2CH_2-$) to obtain the phnoxyacetic acids binding antibody (see the attached English translation of Abstract of Kawada). Due to the similarity in the structure between the phenoxyacetic acids and Kawada compound, an antibody obtained using the Kawada compound specifically binds the phenoxyacetic acids. Contrary to Kawada, the claimed compound of formula (I) is a competitor of dioxins to anti-dioxin antibody in an immunological assay of dioxins.

In an immunology, one skilled in the art would understand that an antibody specifically recognizes and binds an antigen of the antibody; specificity of antigen-antibody reaction. The chemical structure of the claimed compound is immunologically away from the one of the phenoxyacetic acids. Thus, an antibody obtained using the claimed compound of formula (I) would not specifically bind the phenoxyacetic acids. Consequently, one skilled in the art would NOT have been motivated to make the claimed compound of formula (I) (n=5-10), in the expectation that the claimed compounds will have similar properties to the Kawada compound.

A prima facie case of obviousness cannot be made when one skilled in the art would not have expected a claimed compound has similar properties to a compound disclosed in the cited art. The MPEP 2144.09 explicitly states:

> "An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound, in the expectation that compounds similar in structure will have similar properties." *In re Payne*, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 1979).
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> Homology and isomerism involve close structural similarity which must be considered with all other relevant facts in determining the issue of obviousness. *In re Mills*, 281 F.2d 218, 126 USPQ 513 (CCPA 1960); *In*

> *re Wiechert*, 370 F.2d 927, 152 USPQ 247 (CCPA 1967). Homology should not be automatically equated with *prima facie* obviousness because the claimed invention and the prior art must each be viewed "as a whole." *In re Langer*, 465 F.2d 896, 175 USPQ 169 (CCPA 1972)

An antibody obtained using the compound of formula (I) (n=5-10) of claim 1 would NOT specifically bind the phnoxyacetic acids because of the specificity of an antigen-antibody reaction. One skilled in the art would NOT have been motivated to make the claimed compound of formula (I) (n=5-10) since there is no expectation that an antibody obtained using the claimed compound will have similar specificity to the antibody obtained using the Kawada compounds.

Moreover, the Examiner contends irregular addition of a CH_2- group to the teaching of Kawada since Kawada requires B of the Kawada compound not be ethylene ($-CH_2CH_2-$). Kawada discloses the Kawada compound wherein B is methylene ($-CH_2-$), ethylidene ($CH_3CH=$), or trimethylene ($-CH_2CH_2CH_2-$) (see the attached English translation of Abstract of Kawada). The attached full English translation of Kawada explicitly teaches that B cannot be mere strait-chain alkylene.

In this connection, MPEP 2144.09 states that if "compounds [differ] regularly by the successive addition of the same chemical group, e.g., by $-CH_2-$ groups)," the compounds may be of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. The Examiner does not show the expectation of similar properties since the claimed compound differs from the Kawada compound irregularly by the addition of a CH_2- group to the Kawada compound.

MEPE 2144.09 explained this point in more detail as follows:

> *Ex parte Blattner*, 2 USPQ2d 2047 (Bd. Pat. App. & Inter. 1987) (Claims directed to compounds containing a 7-membered ring were rejected as prima facie obvious over a reference which taught 5- and 6-membered ring homologs of the claimed compounds. The Board reversed the

> rejection because the prior art taught that the compounds containing a 5-membered ring possessed the opposite utility of the compounds containing the 6-membered ring, undermining the examiner's asserted prima facie case arising from an expectation of similar results in the claimed compounds which contain a 7-membered ring.).

(See MPEP 2144.09). Just like the 5-membered ring compound in *Ex parte Blattner* that does not possess the similar properties to the 6-membered ring compound and that undermines the examiner's asserted prima facie case arising from an expectation of similar results in the 7-membered ring compound, Kawada teaches that B is NOT a ethylene group and thus this teaching undermines the Examiner's asserted *prima facie* case of obviousness. Contrary to the Examiner's assertion that the claimed compounds would be expected to have similar properties to the prior art compounds, Kawada teaches that mere successive addition of a methylene group to trimethylene of the Kawada compound does NOT provide compounds that have similar properties to the Kawada compound. One skilled in the art would understand that Kawada teaches away from adding methylene groups to this portion of the molecule. Since the Board reversed the *prima facie* obvious rejection in *Ex parte Blattner*, Applicants respectfully request withdrawal of the *prima facie* obvious rejection.

In addition, there would have been **no motivation** in Kawada for one skilled in the art to employ 2,4,5-trichlorophenoxyalkyl carboxylic acid represented by the following formula (I) of claim 1. The Examiner contends that there is not a vast number of structure since "[t]he Kawada et al compounds include only 0-3 chloro and/or methyl substituents on a single phenyl ring" (first paragraph of the Advisory Action). However, there are a hundreds of possible structure of phenyl group of formula II that has $(CH_3)_n$ and Cl_p, wherein n is 0-3 and p is 0-3. It is not obvious to employ 2,4,5-trichlorophenoxyalkyl carboxylic acid from one hundred of structure disclosed by Kawada. In this connection, MPEP 2144.09 explains as follows:

> Homology and isomerism involve close structural similarity which must be considered with all other relevant facts in determining the issue of obviousness. *In re Mills*, 281 F.2d 218, 126 USPQ 513 (CCPA 1960); *In re Wiechert*, 370 F.2d 927, 152 USPQ 247 (CCPA 1967). Homology should not be automatically equated with *prima facie* obviousness because the claimed invention and the prior art must each be viewed "as a whole." *In re Langer*, 465 F.2d 896, 175 USPQ 169 (CCPA 1972) (Claims to a polymerization process using a sterically hindered amine were held unobvious over a similar prior art process because the prior art disclosed a large number of unhindered amines and only one sterically hindered amine (which differed from a claimed amine by 3 carbon atoms), and therefore the reference as a whole did not apprise the ordinary artisan of the significance of hindered amines as a class.).

(See MPEP 2144.09). One skilled in the art could not have arrive at the specific compound in claim 1 based on the teaching of Kawada. One could optimize every substituent group of the phenyl group within the disclosure of Kawada and still not attain the specific compounds defined in claim 1. On the other hand, if the Examiner is contending that it would be obvious to employ 2,4,5-trichlorophenoxyalkyl carboxylic acid represented by the formula (I) of claim 1 wherein n = 5-10, it would be a case of improper reliance on Applicants' own specification to justify the rejection.

Accordingly, the Applicants maintain that a *prima facie* case of obviousness has not been established because (1) one skilled in the art would not have expected that the claimed compound has similar properties to Kawada's compounds since an antibody obtained using the claimed compound would not specifically bind the phenoxyacetic acid, (2) one skilled in the art would not have expected that the claimed compound has similar properties to Kawada's compounds since Kawada teaches that B is NOT a ethylene group, and (3) there would have been **no motivation** in Kawada for one skilled in the art to employ 2,4,5-trichlorophenoxyalkyl carboxylic acid represented by the formula (I) of claim 1 from the vast number of structure of phenyl group of formula II that has $(CH_3)_n$ and Cl_p, wherein n is 0-3 and p is 0-3 of Kawada.

For these reasons, the Applicants respectfully submit that the 35 U.S.C. §103(a) rejection based on Kawada cannot be applied claim 1.

Rejection of Claim 3 Under 35 U.S.C. §102(b)/103(a) over Kawada

Claim 3 stands rejected under 35 U.S.C. §102(b)/103(a) over Kawada. Kawada describes a phenoxyacetic acid (II) on page 2 of Japan Patent Application Publication No. 10-101615. The Applicants respectfully request withdrawal of the rejections for at least the following reasons. Kawada does not disclose, teach or suggest each and every feature of claimed invention.

To establish anticipation, 35 U.S.C. §102 requires that each and every element as set forth in the claim is found, either expressly or inherently described, in a single cited art document. Claim 3 has been amended to recite "n is an integer of 5 to 10" to better distinguish Kawada. Kawada fails to disclose a 2,4,5-trichlorophenoxyalkyl amide derivative represented by the formula (II), wherein n is an integer of 5 to 10 and z is an amino acid or peptide, as required in claim 3. Since Kawada fails to disclose each and every feature of claim 3, Kawada cannot anticipate claim 3. Hence, the rejections should be withdrawn.

With respect to the 35 U.S.C. §103(a) rejection, the Applicants respectfully submit that the rejection based on Kawada cannot be applied claim 3 for the same reasons as mentioned in the previous section. A *prima facie* case of obviousness has not been established particularly with respect to amended claim 3 because (1) one skilled in the art would not have expected that the claimed compound has similar properties to Kawada's compounds since an antibody obtained using the claimed compound would not specifically bind the phenoxyacetic acid, (2) one skilled in the art would not have expected that the claimed compound has similar properties to Kawada's compounds since Kawada teaches that B is NOT a ethylene group, and (3) there would have been **no motivation** in Kawada for one skilled in the art to employ 2,4,5-trichlorophenoxyalkyl carboxylic acid represented by the formula (I) of claim 1 from the

vast number of structure of phenyl group of formula II that has $(CH_3)_n$ and Cl_p, wherein n is 0-3 and p is 0-3 of Kawada. For these reasons, the Applicants respectfully submit that the 35 U.S.C. §103(a) rejection based on Kawada cannot be applied claim 3.

Rejection of Claim 5 Under 35 U.S.C. §103(a) over Kawada

Claim 5 stands rejected under 35 U.S.C. §103(a) over Kawada. The Applicants respectfully request withdrawal of the rejection for at least the following reasons. The cited art does not teach or suggest all the features of the claimed invention.

Kawada discloses an antibody obtained using the Kawada compound and an immunoassay involving the antibody. Claim 5 requires that the immunoassay kit contain the compounds of formula (I) or formula (II) as a competitive antigen, a primary antibody to dioxins and a labeled secondary antibody to the primary antibody. The claimed compounds are a competitor of dioxins to anti-dioxin antibody in an immunological assay of dioxins. Kawada does not disclose, teach, or suggest immunoassay kit containing such compounds, a primary antibody to dioxins and a labeled secondary antibody to the primary antibody. There is NO teaching or suggestion about a competitive antigen in Kawada. Therefore, Kawada fails to teach or suggest all the features of the claimed invention.

In addition, those skilled in the art would not arrive at the immunoassay kit containing the compound of formulae (I) or (II) as a competitive antigen that reacts specifically with anti-dioxin antibodies and does not cross react with chlorobenzenes and chlorophenols. In conventional immunoassay, a competitive antigen is the same compound that has been used as an immunogen to obtain an antibody. When constructing a competitive immunoassay system by using the antibody, the immunogen is used as a competitive antigen or an immobilized antigen. Therefore, in the immunoassay, generally, a compound which has a different structure from that of the immunogen (hereinafter, such a compound is referred to as "Different Compound") is never used as a competitive antigen in view of specificity of antibody.

In the case of measurement of dioxins, the immunogen used to obtain an antibody is a dioxin. In order to enhance immunogenicity of the dioxin, a linker (for example, methylene group) is introduced to the dioxin and a protein (that is, high molecular compound) such as BSA is bound at the end of the linker. That is, a compound consisting of a dioxin-linker-peptide (hereinafter, the compound is referred to as "Dioxin Derivative") is used as an immunogen. Therefore, "Dioxin Derivative" is used as a competitive antigen with an anti-dioxin antibody raised against the "Dioxin Derivative." Generally, because of high toxicity of dioxins, a dioxin analog which has a basic structure of dioxins and in which chloride atoms are substituted with methyl groups so as to reduce its toxicity is used as a competitive antigen in place of dioxins themselves. However, in view of specificity of an anti-dioxin antibody, "Different Compound" cannot be used as a competitive antigen. Therefore, immunoassay of dioxin does not seem to be possible to those skilled in the art using "Different Compound" as a competitive antigen.

In the subject invention, it becomes possible to measure dioxins using a "Different Compound" as a competitive antigen. The subject invention employs a compound which does not have a basic structure of the dioxins. Consequently, the toxicity of this compound is extremely reduced. This is an unexpected result to those skilled in the art as explained below.

In Kawada, since the compound formula II of Kawada is used as an immunogen, those skilled in the art would have expected from the teachings of Kawada that the antibody produced threby can react with the compound but cannot react with dioxins because of specificity of antibody as stated above. Thus, those skilled in the art would not have expected that Kawada's compound can be useful for immunoassay of dioxins. The compound of formula (I) or (II) of the subject invention has different structure from dioxins, which corresponds to the "Different Compound", and does not seem to be used as a competitive antigen with antibodies raised against "Dioxin Derivative." However, in the subject invention, the compound of formula (I) or (II) can react with the anti-dioxin

antibody raised against "Dioxin Derivative", thereby dioxins can be specifically detected by using the compound of formula (I) or (II) as a competitive antigen, as shown in Examples of the present specification. It is quite unexpected result. Therefore, the present invention would not have been obvious over Kawada. For these reasons, the Applicants respectfully submit that the 35 U.S.C. §103(a) rejection based on Kawada cannot be applied claim 5.

Petition for Extension of Time

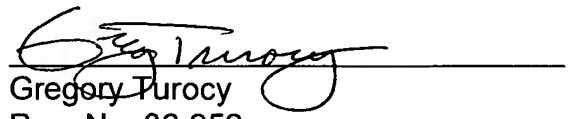
A request for a one month extension of time is hereby made. A Credit Card charge form is enclosed herewith to pay the petition fees.

Should the Examiner believe that a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to our Deposit Account No. 50-1063.

Respectfully submitted,

AMIN & TUROCY, LLP



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